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Mind-Mapping Inside and Outside of the Classroom

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Learning Through Digital Media

Experiments in Technology and Pedagogy

Edited by R. Trebor Scholz

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About This Publication

This publication is the product of a collaboration that started in the fall of 2010 when a total of eighty New School faculty, librarians, students, and staff came together to think about teaching and learning with digital media. These conversations, leading up to the *MobilityShifts* Summit, inspired this collection of essays, which was rigorously peer-reviewed.

The Open Peer Review process took place on MediaCommons,[1] an all-electronic scholarly publishing network focused on the field of Media Studies developed in partnership with the Institute for the Future of the Book and the NYU Libraries. We received 155 comments by dozens of reviewers. The authors started the review process by reflecting on each other's texts, followed by invited scholars, and finally, an intensive social media campaign helped to solicit commentary from the public at large.

The New School is a leading institution when it comes to incorporating cross-disciplinary digital learning into the curriculum. It offered its first Media Studies degree program already in 1975. *Learning Through Digital Media* reaffirms this commitment to interdisciplinary innovation.

[1] See ‹http://mediacommons.futureofthebook.org/mcpress›.

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Mind-Mapping Inside and Outside of the Classroom

D.E. Wittkower

Students who take my courses have neither the desire nor expectation that they will learn anything about digital media. My use of digital media in the classroom is reinforced by a belief that familiarity with new media and digital literacy will be of significant value in their future lives, but is primarily motivated by a belief that digital media offer significant new opportunities for teaching and learning.

In the course I teach most frequently, "Business Ethics," I have frequently redesigned course structure, delivery and activities. While other colleges and universities are beginning pilot programs where iPads are given to all students, I continue to have students who do not have a home computer of any kind, but use on-campus labs to do all their work, which they store a semester at a time on thumb drives. Some of my students have not become comfortable composing on a computer and write all their work by hand before "typing it in" to a computer. Some live in rural areas where only dialup Internet access is available.

These circumstances both limit my use of digital media and make it all the more imperative. I must take care not to disadvantage students who are behind on the learning curve or who lack easy access to digital technology, but if I let

these students complete their degree without making some real progress in that learning curve, the value of their degree will be greatly diminished.

After trying different approaches for two years, I abandoned student blogging assignments. While some students did a great job and gained much from the process, many students performed poorly and hated the experience. They did not understand the format of a blog post: I told them to post a news story related to class and to comment on it, but they would not always include a news story, would sometimes simply summarize the material in the story, or would give a purely personal and diaristic response. In both Word-Press and Blogger, students did not succeed in reliably posting links, either by using the website GUIs or after in-class instruction in basic HTML. The links posted were very often off-topic, and tended to be either about sports or political scandals not connected to business ethics. Comments students left for one another often did not further the conversations, but tended to simply agree with and reiterate the original posts. Several times, I had to delete racist posts.

Much of the problem, I believe, came from their simple lack of familiarity with the platform. Many students reported that they had never read a blog. I suspect that those who had read blogs had likely read blogs centered on sports, entertainment news, or politics, and thus were not likely to have thorough, thoughtful postings and reasonable comments modeled for them in their previous experience. Had I asked students who had never read a newspaper to write a newspaper article, I would not have been surprised if style, tone and structure were completely off. Why should I be surprised when the same thing occurs with a blog post? Blogging is a specific expressive form that is part of my culture and daily life but simply is not a part of theirs.

There are certainly other elements of digital media that are more familiar to all of my students, and I have had more success teaching digital media related to these elements. Three years ago, I got rid of my commercially-produced textbook in "Introduction to Philosophy" and produced a reader of my own selections from Plato, Descartes, Hume, Kant and Nietzsche. All translations used are in the public domain. Other LibriVox volunteers had recorded some of these texts in public domain audio book form—the rest I recorded for LibriVox myself, so that students could listen to the entire text for the class in audiobook form. The reader was provided to students in PDF format for ease of access and keyword-searchability. I continue to require

students to purchase a printed copy, produced by the campus copy services at a cost to the student of less than $15, so that they are more likely to have the text with them in class, since only a small percentage have laptops that they use in class.

The digital reader/listener format has provided a variety of benefits. Poor students often choose not to purchase textbooks, either using the library's copy or borrowing a copy from another student, which produces numerous severe disadvantages including irregular access to course materials, the inability to refer to materials at critical moments such as before exams, a lack of access to materials in class, and the social undesirability of annotating the text itself. These same students are also less likely to have easy access to computers, and sometimes would still choose not to purchase the textbook despite the greatly lowered cost. Overall, though, ease of access was greatly improved by the new reader. Additionally, it seems that nearly every student has an MP3 player. Students have reported reviewing course materials at work, in the gym, and during commutes, and seem to be well-trained in the multi-tasking skills that allow them to take advantage of flexible modes and locations of access to course materials—especially those students who have most to gain from this flexibility, such as those who have full-time jobs and children.

I am in the process of making similar changes to my "Business Ethics" course. I have eliminated our textbook: now our readings are drawn from journals on EBSCOhost and JSTOR, accesses to which students have already paid for through their tuition. Discussion is based around these and other online resources and digital learning objects, most of which can be downloaded and stored or printed, for those with unreliable or irregular off-campus computer or Internet access.

However, only so much can be done while depending solely on digital media with which students are already familiar and comfortable. Their familiarity with digital media like MP3s, M4Bs, PDFs and MPEGs is primarily as consumers, and by building on these consumer-oriented media uses, I do not meet my instructional goal of training students in leadership and self-reliance—for these goals, I have been experimenting with various different ways of using mind-mapping software. Mind maps, a versatile form of digital media, have allowed me to improve student learning in a way that leads to participatory assignments and construction of digital media rather than mere reception

and consumption. While I originally began using mind maps simply as an in-class presentation tool, out of a belief in the pedagogical bankruptcy of PowerPoint, the software has proven very adaptable to a variety of different kinds of content-rich, flexible, and analytic uses.

Concept-mapping was developed by Joseph Novak as a method of representing student understanding in order to better guide student instruction. Novak based this process primarily on David Ausubel's theory of knowledge and learning, based on models from Piaget and Gestalt psychology, which claimed that knowledge was fundamentally hierarchical in structure, and that the process of meaningful learning is constituted primarily by the subsumption of new concepts under existing and established categories. Novak has researched other applications of the concept map structure, including the use of learner-created maps in the learning process and the use of expert-created map in communication and presentation of material, as a "scaffolding" for learning.

While concept-mapping is clearly indebted to Novak's work in particular, the structure has been widely adapted and studied by others. Concept maps are used in brainstorming, in strict conceptual hierarchies, in decision trees, in evidentiary representation and in diagramming arguments. These different applications have been implemented in a variety of ways, and numerous empirical studies have been conducted on various implementation of these structurally-related applications, including use as a study method (Farrand, Hussain and Hennessy), as a student group assignment (Liu and Wang), as an individual in-class exercise (Liu, Chen and Chang), as an individual outside-class assignment (Abi-El-Mona and Abd-El-Khalick; Kokotovich; Wheeler and Collins), and as an in-class instructor-student collaborative activity (Näykki and Järvelä).

In this research, a "mind map" is often but inexactly distinguished from a "concept map." Most commonly, "mind maps" have a single central node, and include images, colors and free associations, often similar to brainstorming; while "concept maps" may have more than one central node and a stricter set of meanings in hierarchical relationships and connections, with little use of images and colors. Since neither consistently implies a particular methodology or application, I use the terms interchangeably. The maps that I utilize in instruction are mind maps insofar as they have only a single central node, but are concept maps insofar as they are highly structured and contain very few images.

Even in scholarly research, the exact structure of these maps is often ill-defined, and the terms "concept map" and "mind map" are best treated as family-resemblance terms, referring to a variety of different applications whose primary structural similarity may be quite superficial. The openness of the structure can be viewed as a feature rather than a bug, but it does make the applicability of empirical studies of the effectiveness of the technique problematic.

There are a great number of different mind-mapping programs available. I have neither investigated nor evaluated software that is not cost-free and cross-platform, as these are basic requirements for maximizing accessibility in keeping with my instructional goals. There is great variety among cost-free, cross-platform programs, including argument-map specific programs, such as Carneades, Athena and Araucaria; strongly structured mapping programs, such as FreeMind, SciPlore MindMapping and Freeplane; and more loosely structured mapping programs, such as XMind, Compendium, VUE and CmapTools.

I use FreeMind most frequently because it is simple and straightforward, allowing me to quickly construct maps for classroom use. It is lightweight enough to construct a map collaboratively in class; it has collapsible nodes, allowing me to create large maps with a great amount of detail without losing the "big picture." Further, it enables insertion of images, allows for limited use of HTML in nodes, and is easy to train students to use. Other software, however, present other kinds of advantages. FreeMind only supports a single center node, which limits the complexity that can be represented by the map. FreeMind does not allow edge-definition: the connections between parent and child nodes cannot be labeled. FreeMind is also particularly uninteresting in appearance.

I have used FreeMind in a number of different ways, and there are several more applications that seem valuable that I have not yet tried:

Expert-created maps

Maps of writing projects: This is similar to writing an outline, but I have found it more useful for gaining a large-scale grasp on what I plan to write about, what questions I am neglecting, and what I am spending too much time on. Also, with collapsible nodes, much more detail can be included in a map-based outline than in a traditional outline.

Maps of presentations: This is my most frequent use of the software. By structuring lecture notes into an outline format using a map with collapsible notes, I am able to present an entire presentation in a single document. The outline that I create for a paper can be expanded into the presentation itself. I put the mind map onscreen during the presentation, click through from topic to subtopic, refer forward and backward to different components present onscreen and collapse and expand nodes as we move forward through the presentation. The mind map can then be provided as a form of lecture notes. I have used a mind map of this sort as a replacement for PowerPoint both in class and in conference presentations.

Maps of recorded lectures: I am currently recording in-class lectures for use in distance education, where M4Bs of lectures will be provided along with a mind map of the presentation for the students to click through as the lecture progresses.

Maps of material to be presented: In my "Introduction to Philosophy" course, rather than mapping out my presentation of the material, I mapped out the material itself, producing, for example, a full paragraph-by-paragraph map of Descartes' *Meditations on First Philosophy*. Each day before class, I would map out the reading to be discussed that day in lieu of putting together lecture notes. This process divided up the work into manageable chunks and forced me to gain a more thorough and careful understanding of the text since I had to map out every argument in every paragraph, not only take notes on the parts I already planned to discuss. This map could then be used as an in-class reference, so we would all know exactly where we were in the text and what was happening in that section, and could also be provided to students in following semesters to use while doing the reading, prior to our discussion.

Learner-created maps

Maps as assessment tools: I have not yet tried this. I see two main methods. Students could be asked to map out their knowledge of a given subject area, and the map could be graded or used as feedback to determine what aspects of the subject area have not been sufficiently covered. Another obvious method would be to provide a student with a partial map, representing, for example, the argument structure within a reading assignment, and students would be assessed based on their success in "filling in the blanks."

Maps as study or mnemonic tools: I have not assigned this as a student activity, but some research has been conducted that suggests mind-mapping, in some forms at least, is more helpful for information retention than traditional study methods.

Maps as research/writing tools: I have not yet tried this, but I know of others who have,

and who have seen success in this use. Just as students might be assigned to produce an outline of a paper before writing, a mind map can be assigned. The mind map structure makes omissions or a lack of detail in some sections more obvious than in a traditional outline, and forces students to categorize topics and subtopics precisely and with attention to the connections made between topics.

Maps as analytic tools: When doing research, in preparation for a writing assignment, I assigned students to map out the topics and arguments contained within their primary sources—in this case, articles from peer-reviewed journals. My in-class use of the software to present arguments from our reading served as a model for the assignment and a rubric was used detailing expectations about hierarchical organization, number of nodes and detail per node. Students reported that the assignment helped them gain a better understanding of the exact content and presuppositions of the argument under analysis, and forced them to slow down and exhibit care that they might not otherwise have taken.
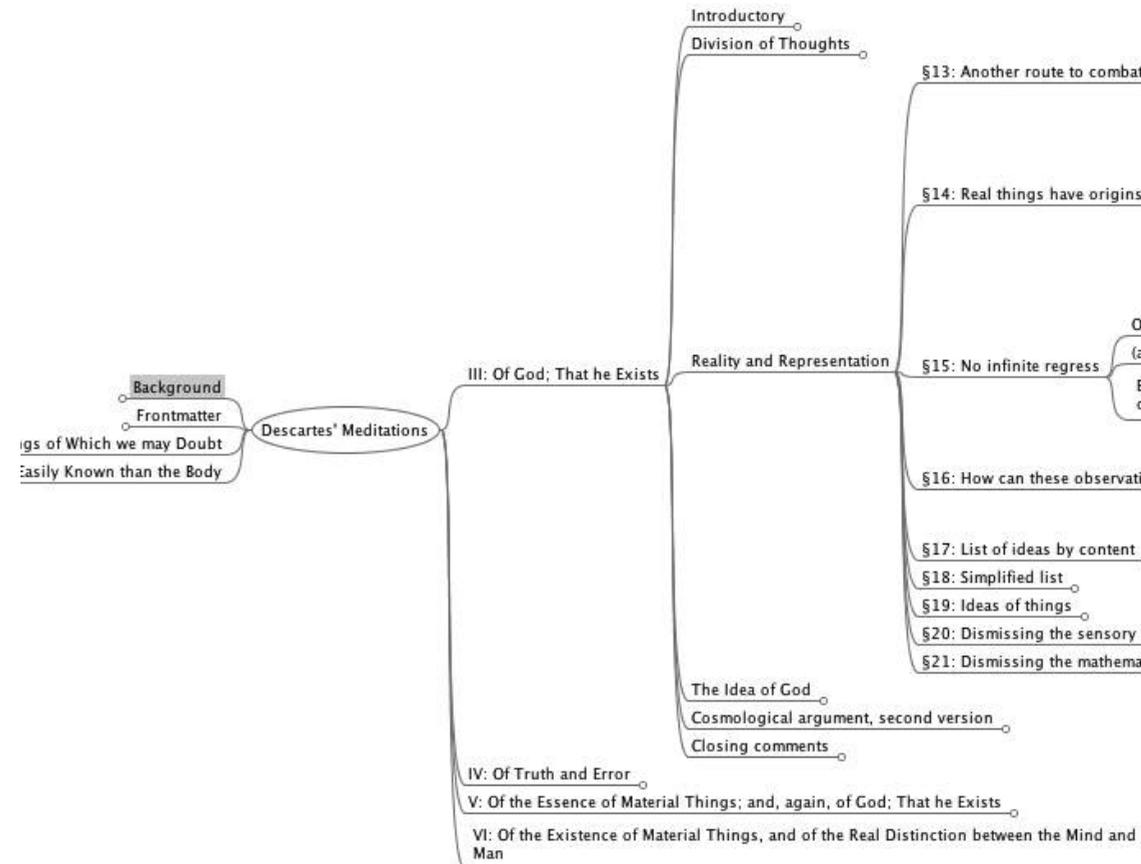
Expert/Learner-created maps

Real-time mapping of in-class discussion: On several occasions, for class sessions based primarily around discussion rather than lecture, I have put a blank map on the overhead, perhaps with a few prompts, like "Truth" or "Justice." As we engaged in Socratic dialogue on these topics, I wrote in my questions and students' answers in real-time. This allowed us to have a wide-ranging conversation while ensuring that students did not become lost, and could keep in mind what had already been discussed and how the discussion had been led to the current proposition under consideration.

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